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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/565,380 | 01/23/2006 | Genichiro Ota | L9289.06101 | 5562 |

52989 7590 05/11/2010

Dickinson Wright PLLC
James E. Ledbetter, Esq.
International Square
1875 Eye Street, N.W., Suite 1200
Washington, DC 20006

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| EXAMINER |
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TIMORY, KABIR A

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| ART UNIT | PAPER NUMBER |
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2611

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| MAIL DATE | DELIVERY MODE |
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05/11/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|-----------------------------------|--|
| Office Action Summary | Application No. 10/565,380 | Applicant(s) OTA ET AL. | |
| | Examiner KABIR A. TIMORY | Art Unit 2611 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8 is/are pending in the application.
- 4a) Of the above claim(s) 2, 3 and 5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4, 6, and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Request for Continued Examination (RCE) Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/07/2010 has been entered.

Response to Arguments

2. This office action is in response to the amendment filed on 04/07/2010. Claims 1, 4, 6, and 8 are pending in this application and have been considered below. Claims 2-3 and 5 are withdrawn by the applicant and claim 7 is canceled by the applicant.

3. Applicant's arguments filed on 02/26/2010 with respect to claim 1 have been considered but are moot in view of new ground(s) of rejection because of the amendments.

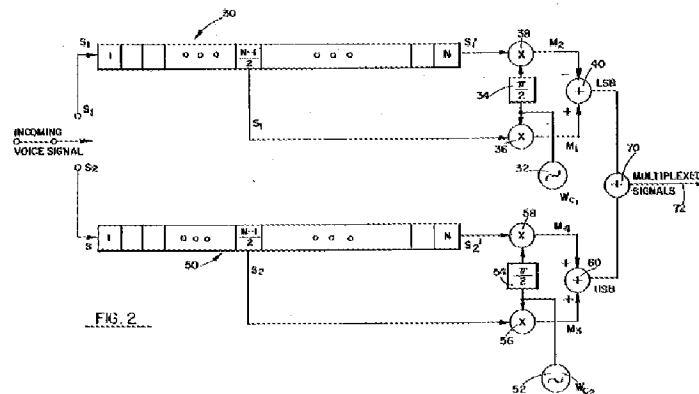
Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 4, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daoud et al. (US 4835791) (disclosed in the IDS filed on 01/23/2006) (hereinafter Daoud) in view of Muzzi et al. (US 3628155) (hereinafter Muzzi).



Regarding claims 1 and 4:

As shown in figures 1-3, Daoud disclose a modulation apparatus comprising:

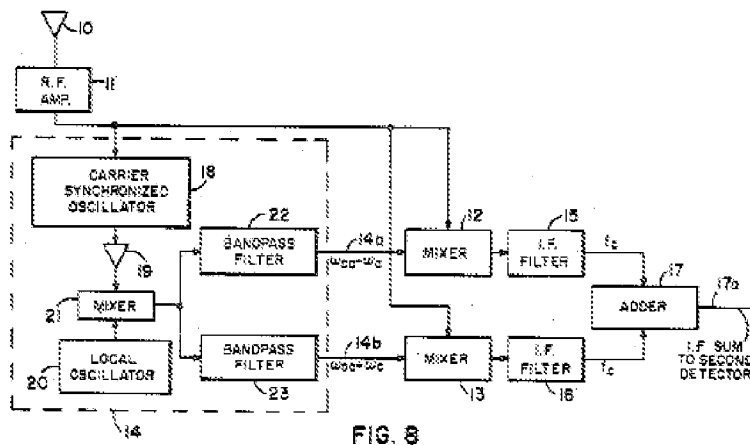
- a first frequency-increasing single side band (SSB) modulator (**30 in figure 2**) that performs SSB modulation on a first input symbol (**S2 in figure 2**) to obtain an upper side band (USB) signal (**USB in figure 2**) (**col 2, lines 29-47**);
- a second frequency-increasing SSB modulator (**50 in figure 2**) that performs the SSB modulation on a second input symbol (**S1 in figure 2**) to obtain a lower side band (LSB) signal (**LSB in figure 2**) (**col 2, lines 29-47**); and
- a combiner (**70 in figure 2**) that combines the USB (**USB in figure 2**) signal and the LSB signal (**LSB in figure 2**) (**col 2, lines 29-47**),

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- wherein the second frequency-increasing SSB modulator performs SSB modulation to obtain the LSB signal using a carrier frequency, the carrier frequency being higher than a carrier frequency used in the first frequency-increasing SSB modulator by a fundamental frequency of the input symbol and the second input symbol (**col 4, lines 38-49**).

Daoud discloses all of the subject matter as described above including a multiplexing summer (**70 in figure 1**) which produces multiplexed signals (**see the output of the summer 70 in figure 1**) except for specifically teaching such that the LSB signal and the USB signal are multiplexed in the same frequency band.

However, Muzzi in the same field of endeavor teaches such that the LSB signal and the USB signal are multiplexed in the same frequency band (**figure 4, 17 in figure 8, col 2, lines 16-28**).



Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to substitute the summer as taught by Muzzi to for the summer of Daoud in order to obtain predictable results (**KSR – simple substitution of one known element for another to obtain predictable results**).

Regarding claims 6 and 8:

Daoud further disclose demodulation apparatus (**see figure 3**) for demodulating a signal combined by the combiner (**70 figure 2**) in the modulation apparatus (**see figure 2**) according to claim 1, the demodulation apparatus comprising:

- a first frequency-decreasing demodulator (**82, 86, and 90 in figure 3**) that demodulates an input modulation signal by a cosine curve with a first carrier frequency (**W_{c1} in figure 3**) to obtain a first demodulation signal (**see the first demodulation signal provided by first demodulator in figure 3**) (col 4, lines 38-49, col 5, lines 43); and
- a second frequency-decreasing demodulator (**84, 88, and 92 in figure 3**) that demodulates the input modulation signal by a sine curve with a second carrier frequency (**W_{c2} in figure 3**) to obtain a second demodulation signal (**see the output of 84, 88, and 92 in figure 3**), wherein
- the second carrier frequency (**W_{c2} in figure 3**) is higher than the first carrier frequency (**W_{c1} in figure 3**) by the fundamental frequency of the first input symbol (**S2 in figure 2**) and the second input symbol (**S1 in figure 2**) (**see the second demodulation signal provided by second demodulator in figure 3**) (col 4, lines 38-49, col 5, lines 43).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KABIR A. TIMORY whose telephone number is

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(571)270-1674. The examiner can normally be reached on 8:00 AM - 4:30 PM Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kabir A Timory/
Examiner, Art Unit 2611